Regional risk assessment of the European green crab, Carcinus maenas, in Cherry Point, Washington

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Applying the Relative Risk Model (RRM) developed by Landis and Wiegers (1997), we performed the first quantitative, regional risk assessment of a non-indigenous species (NIS) in the Cherry Point region of Washington State with the European green crab (Carcinus maenas) as a model species. Using spatial datasets and ranking schemes from a previous Cherry Point risk assessment of abiotic stressors, peer-reviewed literature and other documentation, we developed ranks for sources and habitats for each sub-region within the study area as well as detailed exposure and effects filters. We then integrated these ranks and filters to determine the relative contribution of each source to risk as well as the risk to each assessment endpoint, habitat and sub-region for conditions during an El Nino year. Finally, we analyzed the uncertainty in the risk estimates using Monte Carlo analysis. Our results suggest that when El Nino-driven current dispersal is considered as a source, the habitat and endpoint with the greatest risk are the eelgrass habitat and the juvenile Dungeness crab, respectively. While much uncertainty still remains when conducting this type of risk assessment, this study identified areas where additional research is necessary in order to more accurately determine risk of introduction and impacts.